

in Australia ; but Howitt wrote fifteen years ago (*Journ. Anth. Inst.*, xiii. p. 459), "I venture to assert that it can no longer be maintained that they have no belief which can be called religious." It is probably more correct to say that religion is intimately connected with nearly every act of the daily life of the Australian aborigine than to deny its existence.

While Dr. Semon gives a vivid account of the natives on the coast of British New Guinea from Yule Island to South Cape, he inadvertently falls into a few errors. It is true that the cranium of the Papuan is decidedly dolichocephalous in certain regions, but along the coast visited by Dr. Semon brachycephalism is almost as common as the other extreme. On more than one occasion the petticoats of the women are said to be made of coco-nut fibre, whereas this is never employed ; the shredded leaf of the sago palm, however, is a very favourite material.

In the account of the murder of George Hunter by his native wife and her accomplices, the impression is given that the wife was entirely to blame. There is another version to this story, which is supported by the petition of the white ladies residing at Port Moresby for the free pardon of the wife. Although, as Dr. Semon is aware, the bow is not used by natives south of Port Moresby, he speaks (p. 373) in general terms for the "whole of South New Guinea" of birds of paradise being killed by "well-directed arrows." But on the whole there are few mistakes, and only a small number of verbal misprints. The general impression created by the book is correct, and the author's personal attitude towards the natives is most commendable. He refers in a kindly spirit to the excellent missionaries of varied creed, and is justly loud in his praises of the administration of Sir William Macgregor.

The illustrations, as a rule, are not particularly good, the views being reproduced from touched-up photographs ; but for this there is a valid excuse, as the camera Dr. Semon took out with him did not stand the climate. Most of the figures of animals are evidently process blocks from pen and ink drawings, and they are somewhat hard and flat. There must necessarily be some defects in a book of travels, and especially in one which embraces so many subjects as this does ; but the present writer would rather insist on the real excellence of the book, which has recalled happy memories of many similar experiences.

AMERICAN NATURAL HISTORY.

Chapters on the Natural History of the United States.

By R. W. Shufeldt. Pp. 480. Illustrated. (New York : Studer Brothers, 1897.)

ALTHOUGH bearing on its title-page the date 1897, for some reason or other copies of this work appear only recently to have been received in this country ; and in reading the volume it is important that the date of publication should be borne in mind, as otherwise certain statements might be taken to indicate that the author was somewhat behind the time.

As a technical worker in several branches of zoology, Dr. Shufeldt has attained a well-merited reputation on both sides of the Atlantic ; but, like many other naturalists

of position, he is not above putting the results of some of his investigations and studies in popular form for the benefit of the "man in the street." And the present handsome and beautifully illustrated volume is in the main a reproduction of popular articles on various branches of natural history which appeared in American periodicals. Whenever he considered it necessary, the author has, however, made corrections and additions to the original text in order to bring it up to date. Although the greater portion of the matter relates to birds, the work naturally covers a wide field. We have, for instance, in addition to those on ornithology, chapters on the methods of study of natural history, classification of mammals, crayfish and crabs, sawfish, rays, and sharks, whales and manatees, various rodents, and bats and their habits. And in each and all of these the same level of interest, combined with instruction, that characterises the first is fully maintained.

Over many of his fellow naturalists, at least in Europe, Dr. Shufeldt has a very great advantage from the fact that he is an accomplished artist, both with the pencil and the brush, while he also makes full use of the camera. And in the first chapter of the volume he urges the extreme importance of the artistic power in the making of a good naturalist. Possibly he may lay an undue stress on the value of this capacity, but there can be no question that the "artistic eye" affords a guide in the correct diagnosis of allied animals that nothing else can replace.

And here it may be well to draw attention to the thoroughness of the author's methods of research, and the importance attached by him to observations in the field. The following, for instance, he gives as the method of procedure for a naturalist to adopt in describing an animal :—

"Having obtained all the possible light upon its habits in nature, and its geographical distribution, and every fact and fiction that has appeared in regard to it in literature—then seize upon all the material obtainable, enough in any event in order to fully exhibit the extremes of variation in size ; the sexual characters ; the eggs, embryos, and young at all stages ; the fossil forms, if any are known ; and finally, an abundance of similar material representing all the apparent allies of the particular form, either near or remote."

Then the specimens are to be examined anatomically, both macroscopically and microscopically.

"Having accomplished all this, we are prepared to use our laboratory notes in writing out an account of the species ; naming it if the form be unknown to science ; and suggesting a place for it in the system."

With such detail in his mode of working, Dr. Shufeldt, it is almost needless to say, is not a "species-maker."

And in this connection his opinion in regard to the species-making now going on in the States should certainly be quoted. When writing of the common chipmunk, for instance (p. 405), he says :

"Some of the other forms resemble it quite closely, while others depart more or less from it in the matter of size and coloration ; some are distributed over a considerable geographical area, others being more or less restricted in their ranges, thus offering descriptive zoologists abundant opportunities to describe the fine

intergrading forms as new sub-species, an opportunity that has been fully availed of by a few ambitious mammalogists more anxious to add to a personal reputation than to be of any special use or aid to the science which they pretend to advance."

This is strong language, but there seems, in some instances, considerable justification for its use.

Of one of the above-mentioned chipmunks, a life-sized figure is given, which may be taken as a good example of the author's own sketches. Excellent as is this figure from a zoological standpoint, it cannot however compare in artistic effect with the reproduction of a photograph taken by the author of the deer-mouse (*Peromyscus leucopus*), which is perhaps the most exquisite in the whole book. The little creature is represented issuing from a maize-cob, on which it has been making a meal, and the half-frightened, stealthy expression of its head is most life-like. Although in our opinion the best of all, this is only one among a number of photographs of various beasts and birds taken by the author himself.

Of the few chapters devoted to mammals, all but one treat of the smaller representatives of the class; but, as if to make up for this, the one exception takes cognisance of the largest of living creatures—to wit, whales. After reading a statement in the introduction to the effect that technical matters were, so far as possible, excluded from the work, we confess to a feeling of surprise at finding nearly three pages of the chapter in question occupied by a technical list of American Cetaceans, many of the names in which are mere synonyms. Apart from this, the chapter is a remarkably interesting one, although it would have been better had some of the illustrations been reduced in size. In view of recent discoveries by the Prince of Monaco, we thought, on first reading the book, that the author was sadly behind the time in his statement that all the markings on Risso's dolphin are normal and not due to conflicts; but this apparent want of revision is fully explained by the date on the title-page. To the same cause may perhaps be attributed the author's relegation of *Zeuglodon* (misspelt, by the way, *Zenglodon*) to a position near the seals, as Prof. Damer's interesting memoir, in which its ancestral cetacean characters are so well brought out, was probably not published in time.

To refer to the other chapters would be to largely exceed our space; and all we can therefore do is to commend the work to the best attention of our readers as an admirable example of what popular natural history should be. Well printed and charmingly and profusely illustrated, it should be welcome alike to young and old, to the professed naturalist and to the non-scientific lover of nature.

R. L.

THE SONGS OF BIRDS.

Cries and Call-Notes of Wild Birds. By C. A. Witchell. Pp. xi + 84. (London: Upcott Gill, 1899.)

IN this book the author carefully describes the cries of over a hundred of the commoner species of birds which are to be heard in or near gardens of towns, woodlands, uplands and riverside. No reader who is at all interested in birds can fail to be impressed with the diligence and patience shown in collecting so much de-

tailed information, and with the extraordinary powers of ear which the author seems to possess.

The cries of birds, as Mr. Witchell implies in his preface, are more readily distinguished from one another by differences of timbre than by differences of musical pitch. Owing to the fact that most birds sing at a very high pitch, it is exceedingly difficult for the human ear to recognise the intervals with certainty. Moreover, the vocal apparatus of a bird is such that he naturally produces several sounds within the compass of one tone of our musical scale; and it is for this reason that nearly all attempts to translate a bird's song into our musical notation are failures. Though familiar with the cries of most of the birds Mr. Witchell mentions, we have been quite unable to recognise several of the strains given in his book when played on the piano. Some of the musical illustrations would remind the hearer of the song if he were already familiar with it, but we doubt if they would convey much idea of it to any one else.

Descriptions of the cries of birds by means of syllables and words are generally very difficult to interpret. It is easy to make the syllables fit the song when that is known, but the syllables give little idea of a song which is unknown to the reader, because there are no universally recognised rules for their pronunciation. Mr. Witchell has been at great pains, but we do not think really satisfactory results can be obtained in the representation of birds' cries by either of the methods he has employed.

There are few inaccurate statements in the book; but the author is mistaken when he writes concerning the song-notes of the great tit, "It is noteworthy that none of our other titmice have any of these cries." The coal tit sings a song not very unlike the ringing note of the great tit, which is represented by the words "chingsee, chingsee." We have spent many hours listening to grasshopper warblers; but we never yet heard one reel for five minutes without a break, nor for even half that time. And we think the author is unjust to the song of the mistle-thrush when he says, "the listener may be led to imagine that some very musical bantam or other such bird is crowing."

In the present work Mr. Witchell has not set himself to discuss the various problems concerning bird-notes, but he incidentally makes assumptions which seem to require more evidence to justify them. Thus he writes:

"In January and February the songs of the blackbird are much shorter than those heard in May, the young birds of the preceding year requiring some practice before attaining proficiency";

and again he says of the skylark:

"These autumn songs seem to be mostly those of young birds of the year, and consist mainly of repetitions of the call-notes, with the addition of a few more musical sounds."

We should like to have more evidence to show that these are songs of the young birds. It is well known that in February many chaffinches can be heard singing which apparently find it difficult to finish the song correctly. Mr. Witchell makes no mention of this; but surely he would not say that all these chaffinches are young birds.

There is yet another point on which we differ with Mr.